DOI: https://dx.doi.org/10.4314/gjedr.v24i1.7

GLOBAL JOURNAL OF EDUCATIONAL RESEARCH VOL 24, 2025: 61-73
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ENVIRONMENTAL SANITATION CONDITIONS AND KNOWLEDGE FOR STUDENTS AND TEACHERS IN PUBLIC SECONDARY SCHOOLS IN CROSS RIVER STATE

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(Received 24, January 2025; Revision Accepted 17, February 2025)

ABSTRACT

This study investigated the environmental sanitation conditions for students and teachers in public secondary schools in Cross River State, Nigeria. Guided by four research questions, the study adopted the descriptive survey research design. The population comprised of all the 4,430 teachers and 16,662 SS2 students across the 274 public secondary schools in Cross River State in the 2022/20223 academic session. The sample was 698 respondents made up of 140 teachers and 558 students drawn using the simple random sampling technique. The instrument used for data collection was Environmental Sanitation Conditions and Knowledge Questionnaire (ESCKQ). It was validated by three experts; one from each of Environmental Education, Social Science Education (Educational Measurements) and Public Health departments of the University of Calabar. The reliability coefficient of 0.90 was obtained on the instrument using the Cronbach Alpha statistics. Data was collected personally by the researchers with the help of two research assistants. The collected data were analyzed using the descriptive statistics of Mean and Standard Deviation. The findings of the study showed that the environmental sanitation conditions in the public secondary schools for students and teachers are poor; but students and teachers in the public secondary schools have high sanitation knowledge, without any significant influence of gender. Based on the findings and conclusions reached, it was recommended among others that the government, through the ministries of education, environment and health, should organize regular workshops and seminars on safe environmental sanitation conditions, sanitation and hygiene knowledge, and practices for both teachers and students in public secondary schools, in addition to ensuring the provision of water and proper toilets for staff and students.

KEYWORDS: Environmental Sanitation, Environmental Sanitation Conditions, Water Sanitation and Hygiene (WASH), Students' Sanitation Knowledge, Teachers' Sanitation Knowledge.

INTRODUCTION

Inspiring potentials and imparting knowledge and skills to students for self-reliance and independence has been a core goal of education. Preparing students for success and leadership in today's interconnected global marketplace is a critical responsibility of educational systems. The knowledge and skills acquired in school are

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particularly essential for developing nations like Nigeria to compete effectively on the global stage. This implies that school attendance would be mandatary for both the teachers and the learners. However, concerns have been raised regarding the frequent student and teacher absenteeism due to illnesses like diarrhea, cholera, and typhoid fever, often linked to poor school sanitation and hygiene (Oluyinka & Adebayo, 2019). While numerous reports on the Millennium Development Goal (MDG) target for sanitation focused on household access, access in public spaces like schools was often overlooked (Oluyinka & Adebayo, 2019). This gap, coupled with the urgent need to address water and sanitation challenges, improve public health, enhance educational outcomes, and achieve Sustainable Development Goals (SDGs), prompted the Federal Government of Nigeria to introduce the Water, Sanitation, and Hygiene (WASH) program in public secondary schools.

The WASH program, a subcomponent of the UNICEF's child survival program initiated in the early 1990s following the International Drinking Water Supply and Sanitation Decade (IDWSSD: 1981-1990), aimed to create healthier, safer, and more conducive learning environments, thereby improving educational outcomes and overall well-being for students and their communities (Akwataghibe, et al, 2018; Folayan et al., 2020). The program's focus on access to safe water, sanitation, and hygiene aligns with the fundamental human need and right to these vital services, essential for dignity and health (United Nations, 2015).

Nigeria's commitment to the SDGs, particularly Goal 6 focusing on clean water and sanitation for all (UNICEF, 2008), further underscores the importance of the WASH program. Specifically, SDG targets 6.1 and 6.2 aim to achieve universal and equitable access to safe drinking water and adequate sanitation and hygiene by 2030 (UNICEF, 2008; Boeren, 2019). Recognizing that school environments play a crucial role in children's development (Egbinola & Amanambu, 2015) and that health significantly impacts educational participation (Ogbe, 2020), the WASH program sought to address the critical need for safe toilets and sanitation facilities in schools (Ofili et al., 2020; Inah et al., 2020).

Improved sanitation in schools not only reduces disease burden but also increases school attendance, economic productivity, and empowers students and teachers by ensuring their environmental comfort and safety (Yoade, 2019; Wada et al., 2020). The WHO/UNICEF (2014; 2016) definitions of improved sanitation emphasize the hygienic separation of human waste and access to facilities like flush toilets, septic tanks, and ventilated improved pit latrines.

Prior to WASH implementation, poor toilet hygiene and lack of access to sanitation facilities posed significant health risks, contributing to absenteeism and long-term health and psychological issues, particularly for girls and students with disabilities (Inah et al., 2020). In response to these challenges, the WASH program was implemented in Cross River State schools starting in 2012, through various initiatives like the WSSSRP II and III, the Nigeria's Country WASH Program, and the PEWASH Program. These programs focused on constructing gender-sensitive VIP latrines and promoting handwashing.

However, despite these efforts, a comprehensive study of the impact of the program's implementation in Cross River State schools, especially with regards to environmental sanitation conditions and knowledge, is lacking. Therefore, this study seeks to assess the environmental sanitation conditions and knowledge for students and teachers in public secondary schools in Cross River State, Nigeria. Specifically, this study seeks to:

i. Find out the environmental sanitation conditions for students and teachers in the public secondary schools;
ii. Determine the extent of sanitation knowledge for students and teachers in the public secondary schools;
iii. Explore the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools; and,
iv. Investigate the influence of gender on sanitation knowledge for students and teachers in the public secondary schools.

LITERATURE REVIEW:

This review summarizes existing literature on environmental sanitation conditions, sanitation knowledge and hygiene practices among students and teachers in public secondary schools, and considers the influence of gender. While direct studies on the intersection of these factors are

limited, the reviewed literature offers valuable insights into the individual components.

Environmental Sanitation Conditions for Students and Teachers in Public Secondary Schools

Several studies highlight challenges in maintaining adequate environmental sanitation in Nigerian schools. Bisi-Onyemaechi et al. (2018) found that a significant number of primary schools in Enugu State lacked functional toilets and proper sewage disposal, leading to open defecation. Similarly, Ohwo (2019) observed open defecation in some secondary schools in Bayelsa State due to a lack of toilets and reported inadequate cleaning schedules and hygiene standards for existing facilities. Waste disposal practices are also a concern. Bisi-Onyemaechi et al. (2018) documented open dumping of refuse in some schools, while Chabo and Antor (2018) and Stanley et al. (2018) reported littering and inadequate waste management in secondary and primary schools in Cross River and Bayelsa States, respectively.

Abe et al. (2019) further corroborated this, highlighting the presence of bushes and accumulated garbage in primary schools in Nasarawa State. While some studies like Azuonwu and Okere (2022) found evidence of weekly environmental sanitation and waste collection in Rivers State secondary schools, the overall picture suggests a need for improvement. The frequency of toilet cleaning is also a factor, with Amadi et al. (2020a) revealing varied practices in primary schools within the Federal Capital Territory, including a significant proportion of schools without toilets. These studies collectively demonstrate that environmental sanitation conditions in Nigerian schools, including access to and maintenance of toilets, waste disposal practices, and general cleanliness, often fall short of recommended standards.

Sanitation Knowledge for Students and Teachers in Public Secondary Schools

While a comprehensive understanding of sanitation knowledge among Nigerian secondary school students and teachers remains limited, some studies offer glimpses into this area. A study by Amadi et al. (2020a) assessed sanitation practices among primary school pupils in the Federal Capital Territory, including inquiries about handwashing frequency and waste disposal methods. Although focused on primary schools, this study highlights the importance of understanding hygiene behaviors, which are often linked to sanitation knowledge.

Similarly, research by Azuonwu and Okere (2022) examined the level of practice of a healthful school environment among secondary school students in Rivers State, which included aspects of waste management. While this study primarily focused on practices, it indirectly suggests a level of awareness about environmental sanitation among the students. These studies, though not directly measuring sanitation knowledge, underscore the need for further research to explore the depth of understanding regarding sanitation principles, disease transmission, and hygiene practices among students and teachers.

The existing literature reveals a gap in research specifically addressing sanitation knowledge among secondary school students and teachers in Nigeria. While studies like those by Amadi et al. (2020a) and Azuonwu and Okere (2022) touch upon related aspects like hygiene practices and healthful school environments, they do not directly assess the level of understanding of sanitation concepts. This lack of focused research highlights the need for studies that delve into the specific knowledge and awareness of students and teachers regarding sanitation, including topics such as proper waste disposal, the importance of handwashing, and the link between sanitation and health. Understanding the existing level of sanitation knowledge is crucial for developing effective interventions and educational programs to improve sanitation practices and promote healthier school environments.

Influence of Gender on Environmental Sanitation Conditions for Students and Teachers in Public Secondary Schools

Gender plays a significant role in influencing environmental sanitation conditions for students and teachers in public secondary schools in Nigeria. Studies have shown that girls and women often face unique challenges related to sanitation due to biological factors, social norms, and cultural practices (UN Women, 2016). For instance, the lack of gender-segregated toilets or inadequate disposal facilities for menstrual hygiene products can negatively impact girls' school attendance and overall well-being (Otonoku et al, 2021). Furthermore, traditional gender roles may place the responsibility of maintaining cleanliness and sanitation on female students and teachers, potentially adding to their burden (Gates Gender Equality Toolbox, n.d.).

However, it is important to acknowledge that boys and men are also affected by poor sanitation conditions. Studies have indicated that inadequate sanitation facilities can increase the risk of infectious diseases for all students and staff, regardless of gender (Ajayi, 2016). Additionally, socio-cultural norms may discourage boys from expressing concerns about sanitation or hygiene, leading to their needs being overlooked (UN Women, 2016). Therefore, it is crucial to adopt a gender-sensitive approach to sanitation interventions in schools, ensuring that the needs of both male and female students and teachers are addressed comprehensively. This includes providing adequate and gender-segregated facilities, promoting hygiene education for all, and challenging harmful gender norms that hinder access to and utilization of sanitation services.

Influence of Gender on Sanitation Knowledge for Students and Teachers in Public Secondary Schools

The role of gender in shaping sanitation knowledge and practices among students and teachers in Nigerian public secondary schools is very significant. Studies have shown that female students often demonstrate better knowledge of hygiene and sanitation compared to their male counterparts, likely due to socio-cultural factors that place a greater emphasis on cleanliness and hygiene for girls (Ogunjumo, 2020). This difference in knowledge can also influence sanitation behaviors, with girls more likely to adopt hygienic practices such as handwashing with soap and water (Suleiman, 2018). However, challenges such as inadequate and gender-segregated toilet facilities in schools can disproportionately affect girls' ability to practice proper sanitation, leading to issues like absenteeism and school dropout (UNICEF, 2016).

For teachers, gender also influences their roles in promoting sanitation within the school environment. Female teachers are often at the forefront of hygiene education and the implementation of sanitation programs, reflecting societal expectations of women as caregivers (Idowu, 2022). They may also face challenges in advocating for improved sanitation facilities, particularly in schools where decision-making is predominantly male-dominated. Addressing these gender-related disparities in sanitation knowledge and practices requires a multi-faceted approach, including targeted interventions to improve sanitation infrastructure, gender-sensitive hygiene education, and empowering female teachers and students to actively participate in sanitation initiatives within their schools (World Bank, 2017).

METHODOLOGY

A descriptive survey research design was utilized for the study. T was conducted in Cross River State. The state is made up of 18 LGAs. All secondary school teachers (4,430) and SS2 students (16,662) in the area served as the population. Simple random sampling technique was employed to select 698 respondents for the study. 2 schools from each of the state's 18 local government areas were randomly sampled before students and teachers were randomly sampled from the selected schools. Prior to that, the Krejcie and Morgan (1970) sample size determination method was adopted to determine the study's sample from the teachers' and students' total population. The total population of teachers and students is 21,092, the sample size for the population is approximately 377. However, to account for attrition bias, (this refers to systematic differences between groups in withdrawals from a study, and withdrawals from the study lead to incomplete outcome data) the desired sample size was increased by (85%) giving a sample size of 698 for more accuracy. Therefore, 698 respondents made up of 140 teachers and 558 students were used for the study.

A questionnaire tagged "Environmental Sanitation Conditions, Knowledge and Hygiene Practices Questionnaire (ESCKHPQ)" was used for collecting data. The instrument's validity was established through expert reviews conducted by three specialists representing the fields of Public Health, Environmental Education, and Educational Measurement. The reliability estimate method used was Cronbach Alpha and the result was 0.90. Mean and Standard Deviation scores were used for data analysis. The keys for the judgmental mean scores are as follows - VLE = Very Lowly Extent, LE = Lowly extent, HE = Highly Extent, VHE = Very Highly Extent, and; NA = Never Available, RA = Rarely Available, OA = Often Available, AA = Always Available.

Research Questions

The following research questions guided the study;

i. What are the environmental sanitation conditions for students and teachers in the public secondary schools?

ii. What is the extent of sanitation knowledge for students and teachers in the public secondary schools?

iii. To what extent does gender influence the environmental sanitation conditions for students and teachers in the public secondary schools?

iv.

v. To what extent does gender influence the sanitation knowledge of students and teachers in the public secondary schools?

Analyses and Results

Research Question 1: What are the environmental sanitation conditions in the public secondary schools for students and teachers?

Table 1: Mean and Standard Deviation on the environmental sanitation conditions in the public secondary schools for students and teachers

SN	Item Statement	students n = 528		teachers n = 140		Decision
		Mean	Std dev.	Mean	Std dev.	
1	My school environment is characterized by littered waste	3.20	0.78	2.13	1.04	-
2	My school environment is characterized by numerous unchecked refuse heaps	2.94	1.01	2.33	1.95	-
3	My school environment is characterized by patches of un-clear bushes	2.67	0.05	2.14	1.04	-
4	My school environment is characterized by uncontrolled disposal of urine and faeces	3.39	0.87	3.41	0.86	A
5	My school environment is characterized by numerous stagnant water pools during rainy season	2.86	1.18	2.89	1.16	A
6	My school environment is characterized by debris-filled gutters	2.81	1.32	2.85	1.31	A
7	My school environment is characterized by drainage systems	2.84	1.23	2.87	1.21	A
8	My school environment is characterized by presence of mosquitoes during official school hours	3.07	1.11	3.06	1.08	A
9	My school environment is characterized by dirty urinal	3.20	1.04	2.70	1.26	A
10	My school environment is characterized by dirty toilet	2.68	1.25	2.24	1.22	-
	Total Mean	**2.97**	**1.08**	**2.66**	**1.08**	**A**
	Grand Mean	**2.82**				

X= mean, Std. Dev. = standard deviation, A =Agree, NA =Not Agree

In table 1 above, in order to answer research question 1, the scores from the responses of the respondents on the environmental sanitation conditions in the public secondary schools for students and teachers were analyzed. The result showed mean ratings of 2.50 and above for items 4, 5, 6, 7, 8, and 9; indicating that both students and teachers of public secondary schools agreed that there are always bad environmental sanitation conditions in secondary schools.

Item 1, 2, 3, and 10 were the items agreed by the students alone because they have mean above 2.50 while teachers didn't agree with these items because their mean were below 2.50. Meanwhile the total mean for students and teachers which are 2.97 and 2.66 respectively were above 2.50 as

well the grand mean of 2.82, which showed that the environmental sanitation conditions in the public secondary schools for students and teachers is poor.

Research Question 2: What is the extent of students and teachers' sanitation knowledge in the public secondary schools?

Table 2: Mean and Standard Deviation on students and teachers' sanitation knowledge in the public secondary schools

S/n	Item Statement	students n = 528		teachers n = 140		Decision
		Mean	Std dev.	Mean	Std dev.	
1	Littered waste	3.31	0.76	3.06	1.14	A
2	Stagnant water	3.06	1.03	2.83	1.25	A
3	Clearing bushes around the school	2.84	1.06	3.39	0.98	A
4	Urinating around the bushes in the school	3.43	0.84	3.72	0.75	A
5	Feeses around the bushes in the school	2.96	1.15	3.94	0.23	A
6	Dirty classroom	2.86	1.31	3.21	1.21	A
7	Debris-filled gutters	2.90	1.23	3.42	0.98	A
8	Drainage systems	3.16	1.10	3.51	0.84	A
9	Dirty Urinal	3.40	0.91	3.20	1.15	A
10	Dirty Toilet	2.84	1.24	3.09	1.13	A
11	Refuse heaps	2.95	1.23	3.59	0.86	A
12	Fumigation of school environment	2.99	1.21	2.86	1.25	A
	Total Mean	**3.06**	**1.09**	**3.32**	**0.98**	**A**
	Grand Mean 3.19					

X= mean, Std. Dev. = standard deviation, A =Agree, NA =Not Agree

In table 2 above, in order to answer research question three, the scores from the responses of the respondents on the students and teachers' sanitation knowledge in secondary schools were analyzed. The result showed mean ratings above 2.50 for all the items for both students and teachers. It also showed the total mean and grand mean were above 2.50, with total mean of 3.06 and 3.32 for students and teachers respectively as well as the grand mean 3.19. This is an indication that students and teachers in the public secondary schools have high sanitation knowledge conditions for students and teachers in the public secondary schools?

Research Question 3: To what extent does gender influence the environmental sanitation

Table 3: Mean and Standard Deviation on the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools

Variables	N	Mean	SD	
Students				
Male	245	2.0163	0.6833	
Female	283	1.8481	0.3596	
Teachers				
Male	56	1.6429	0.4835	Female
	84	1.8810	0.9744	

The result on table 3 shows the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools. The result indicates that the mean scores for male and female students of 2.0163 and 1.8481 with standard deviation of 0.6833 and 0.3596 respectively. The table also showed the mean scores for male and female teachers of 1.6429 and 1.8810 with standard deviation of 0.48349 and 0.9744 respectively. This is an indication that there's slight mean difference between male and female students/teachers on the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools. The mean scores are below 2.5 which is an indication that the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools is poor.

Research Question 4: To what extent does gender influence the sanitation knowledge of students and teachers in the public secondary schools?

Table 4: Mean and Standard Deviation on the influence of gender on sanitation knowledge for students and teachers in the public secondary schools

Variables	N	Mean	SD
Students			
Male	245	2.6449	0.0904
Female	283	2.9329	1.0310
Teachers			
Male	56	2.8036	1.1665
Female	84	3.4286	0.6992

The result on table 4 shows the influence of gender on sanitation knowledge for students and teachers in the public secondary schools. The result indicates that the mean scores for male and female students of 2.6449 and 2.9329 with standard deviation of 0.0904 and 1.0310 respectively. The table also showed the mean scores for male and female teachers of 2.8036 and 3.4286 with standard deviation of 1.1665 and 0.6992 respectively. This is an indication that there is mean difference between male and female students/teachers on the influence of gender on sanitation knowledge for students and teachers in the public secondary schools. The mean scores are above 2.5 which showed that the influence of gender on sanitation knowledge for students and teachers in the public secondary schools is good. Male and female students and teachers in the public secondary schools have sanitation knowledge on WASH program.

DISCUSSION OF FINDINGS

The result from the first research question as shown in table 1 clearly indicates that the environmental sanitation conditions in the public secondary schools for students and teachers are poor. The study's findings, which highlight problems such as littering, open dumping, and unsanitary toilet facilities, align with a growing body of evidence. Specifically, the work of Chabo & Antor (2018), Abe et al. (2019), and Inah et al. (2020) corroborates these observations, collectively painting a concerning picture of the environmental challenges facing students and teachers in public secondary schools. These consistent findings underscore the urgent need for interventions to improve school sanitation and hygiene.

The result from the second research question as shown in table 2 indicate that students and teachers in the public secondary schools have high sanitation knowledge. This finding is consistent with existing literature. Several studies conducted within the past few years have similarly reported commendable levels of sanitation knowledge among this demographic. For instance, a study by Ogunjumo et al. (2020) found that secondary school students in rural Nigeria demonstrated a good understanding of key sanitation principles. Similarly, research by Suleiman et al. (2018) revealed that students possessed sound knowledge regarding handwashing and its importance in preventing disease transmission. Furthermore, Idowu et al. (2022) highlighted the significant role of teachers in promoting hygiene education, suggesting that their own knowledge base contributes to students' understanding of sanitation. These studies collectively support the present finding, indicating a positive trend in sanitation knowledge within Nigerian secondary schools.

The finding from the third research question, indicating a mean score below 2.5 suggests a poor influence of gender on environmental sanitation conditions for students and teachers in public secondary schools. This aligns with several studies highlighting the persistent challenges related to gender and sanitation. Research by Simeon (2019) demonstrated that gender often plays a role in access to and use of sanitation facilities, with girls and women frequently facing more significant barriers. Similarly, studies by Anyaegbunam (2021) have shown that the design and maintenance of school sanitation facilities often fail to consider the specific needs of female students, contributing to poor environmental sanitation conditions. Furthermore, research by Ezeah (2017) emphasized the intersection of gender, socio-economic status, and cultural norms in shaping sanitation practices, which can negatively impact the overall sanitation environment in schools. These studies collectively corroborate the present finding, emphasizing the complex interplay between gender and sanitation outcomes in Nigerian public secondary schools.

The finding from research question four as shown in Table 4, prove that Male and female students and teachers in the public secondary schools have sanitation knowledge on WASH program. This is supported by existing body of knowledge. Several studies indicate a general awareness of WASH principles across genders in educational settings. Research by Adamu et al. (2020) explored WASH knowledge among students in northern Nigeria and found comparable levels of understanding between male and female participants. Similarly, a study by Ihemegbulem et al. (2018) investigating teacher preparedness for WASH implementation in schools noted that both male and female teachers demonstrated adequate knowledge of

key WASH components. Furthermore, research by Ogunjumo (2019) focusing on sanitation knowledge and practices among secondary school students, while highlighting some gender-related differences in practices, also indicated a foundational understanding of WASH concepts among both male and female students. These studies collectively suggest that both male and female members of the school community possess a base level of WASH knowledge, although the application of that knowledge in practices may vary.

CONCLUSION/RECOMMENDATIONS

Based on the study's findings, it was concluded that the environmental sanitation conditions in the public secondary schools for students and teachers are poor; the students and teachers in the public secondary schools have high sanitation knowledge; the influence of gender on environmental sanitation conditions for students and teachers in the public secondary schools is poor, and; male and female students and teachers in the public secondary schools have sanitation knowledge on WASH program.

Accordingly, it was recommended that the government, through the ministries of education, environment and health, should organize regular workshops and seminars on safe environmental sanitation conditions for both teachers and students in public secondary schools, ensuring that adequate latherin facilities are provided for the students and teachers.

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